

Title: Discussion on 4d N=2

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It relates the Virasoro conformal blocks $\mathcal{Z}(\sigma, \mathbf{m}; q)$ for $c = 1$, on the one hand, to the isomonodromic tau-functions $\mathcal{T}(\sigma, \eta; \mathbf{m}; q)$, on the other hand. The variables σ and η are special coordinates for the monodromy data of a holomorphic connection on the the four-punctured sphere with regular singularities at all four punctures, and singular behaviour at the four punctures parameterised by $\mathbf{m} = (m_1, \dots, m_4)$. The variable q denotes the cross-ratio of the positions of the four punctures. A brief review of the GIL formula [GIL] and its proof using CFT methods [ILT] can be found in [Te17].

1.2 Blow-up formula

Nekrasov's derivation of the GIL formula [Ne20] starts from the following blow-up formulae for instanton partition functions of the $N_f = 4$, $SU(2)$, $\mathcal{N} = 2$ SUSY gauge theory in the presence of a "full" surface operator:

$$\begin{aligned} \Psi(a, \mathbf{m}; w, q; \epsilon_1, \epsilon_2) &= \\ &= \sum_{n \in \mathbb{Z}} \Psi(a + \epsilon_1 n, \mathbf{m}; w, q; \epsilon_1, \epsilon_2 - \epsilon_1) Z(a + \epsilon_2 n, \mathbf{m}; q; \epsilon_1 - \epsilon_2, \epsilon_2) \end{aligned} \quad (1.2)$$

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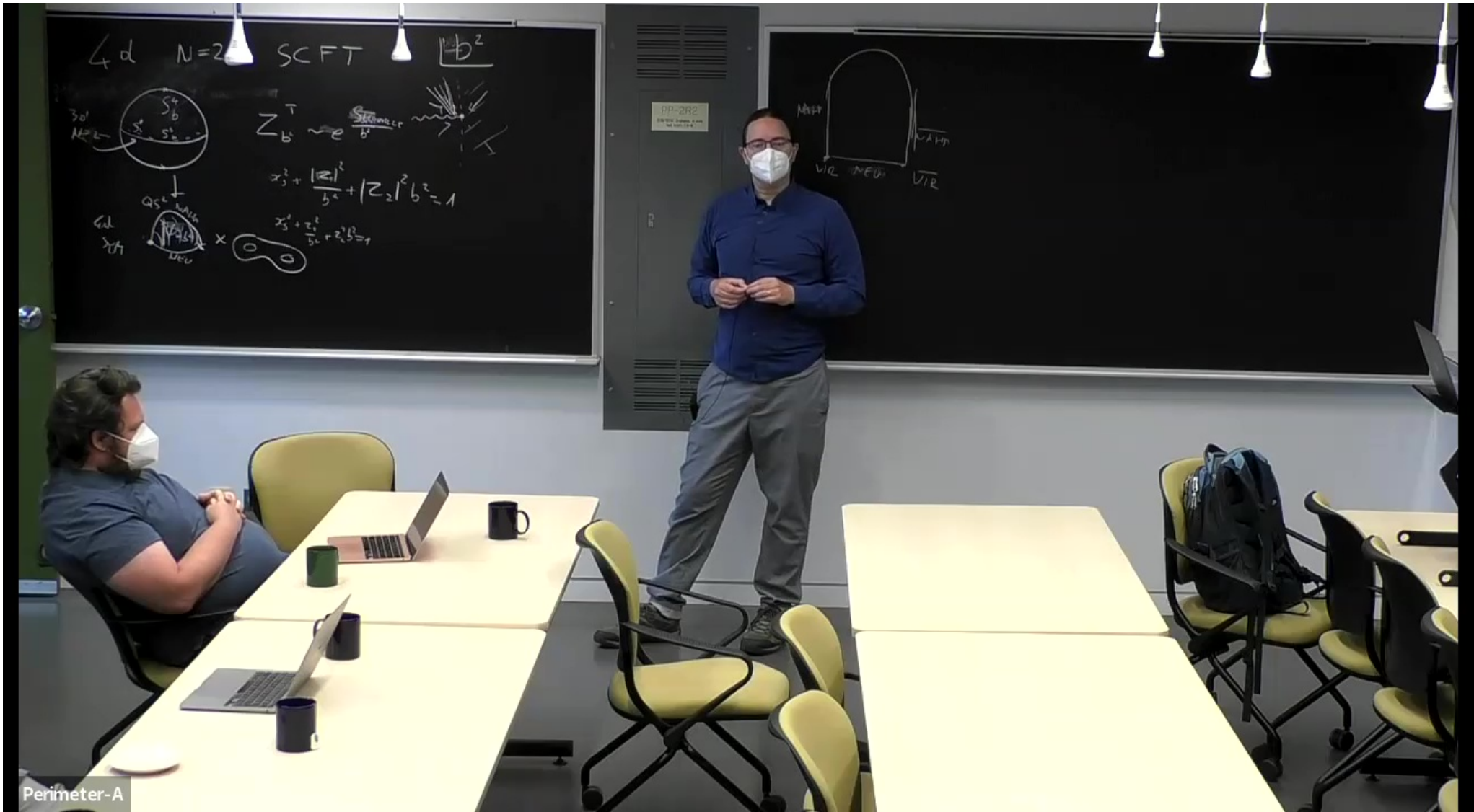
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- a : Coulomb-branch parameter.
- $\mathbf{m} = (m_1, \dots, m_4)$: Vector of four mass parameters.

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Perimeter-A